Remarks

This is in response to the Office Action dated July 16, 2004.

Claims 1, 7 and 11 were rejected under 35 U.S.C. 103(a) over Takahashi USP3795876 in combination with Covell USP5828994; and the remaining claims were rejected as being obvious under 35 U.S.C. 103 in light of the Takahashi and Covell combination and further in view of the Ding IEEE publication.

Per the above amendment, claims 2, 3 and 8 have been cancelled, claims 1, 4 – 7 and 9 – 11 amended, and claims 12 – 16 added.

As amended, claim 1 now includes the limitations of canceled claims 2 and 3. Claims 7 and 11 have also been amended in the similar way to Claim 1. Hence all the pending claims include the characteristic configuration of canceled claim 3.

It is respectfully submitted that none of the cited references Takahashi USP3795876, Covell USP5828994 and "Ding IEEE" discloses or suggests a combination of detecting means (35), difference data calculating means (34), weighting means (35), and producing means (36) according to Applicants' invention (refer to Fig. 3). Independent claims 1, 7 and 11 each moreover include the limitation that "the detecting means (or step) detects an interval of time between two adjacent waveform peaks of the low-pass-filtered digital audio signal, a polarity of a gradient of the waveform changing at each of the two adjacent waveform peaks and the interval of time being detected by measuring the number of times of sampling based on the converted sampling frequency." Note in particular that one feature of each of the independent claims 1, 7, and 11 is that the interval of time is detected by measuring the number of times of sampling based on the converted sampling frequency (Fs). This is supported by, for example, the disclosure in page 10, lines 3 – 6.

Thus, Applicant's invention is able to provide various advantages, including:

1) The analysis/prediction processing carried out with PCM audio data makes it possible to closely restored the PCM data that had deteriorated through data compression to the original PCM audio data, and thereby providing higher-quality audio data;

2) The technique according to Applicants' invention is also possible with software processing. Thus, there is no need for preparing new hardware configurations when Applicants' invention is reduced into practice, thus making it feasible for a variety of applications at lower cost; and

3) For an apparatus in which an audio signal is processed at a lower bit rate, clearness of the audio to be replayed can be increased.

None of the cited references provides the above advantages.

Focus now specifically to why amended claims 1, 7 and 11 are patentable over Takahashi in view of Covell.

Takahashi discloses the use of analog-processing multiple LPFs to divide the frequency band of a signal to be transmitted. In each of the divided bands a signal level is actively changed (i.e., compressed and expanded to reduce noise caused in a transmission-system path). However, Takahashi fails to show the configurations corresponding to the difference data calculating means, weighting means and producing means of Applicant's invention. The examiner alleges that Covell discloses those three means instead. But Covell fails to disclose or suggest such constructions, because, at the minimum, the detecting means (step) of Covell do not include the contents described in canceled claim 3 of Applicants' invention.

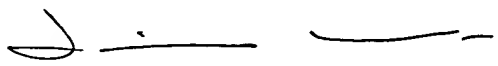
Claims 1, 7 and 11 have been amended to include the limitation in claim 3 (that is, the interval of time is detected by measuring the number of times of sampling based on the converted sampling frequency). In this respect, the examiner pointed out that Takahashi lacks the configuration in which the interval of time of the two adjacent waveform peaks is

measured by the number of time of sampling but, instead, Covell discloses such a configuration.

Yet a more careful study of Covell shows a totally different view from the examiner's one. In the Office Action, page 5, the third paragraph, the examiner indicates "col. 9, lines 32 – 33 and col. 6, lines 30 – 50" as descriptions corresponding to the feature in claim 3 of Applicant's invention. However, those portions explain only an energy-based measure for estimating the emphasis of a speech signal on a frame-by-frame basis. In Covell as well as Takahashi and Ding IEEE, there is neither description nor even a hint of the configuration that "the interval of time is detected by measuring the number of times of sampling based on the converted sampling frequency."

Therefore, in view of the foregoing amendments and arguments, it is respectfully submitted that the present application is in condition for allowance.

Respectfully submitted,



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